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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:  
Podrebarac et al.

Serial No.: 10/055,196

Filed: 01/23/02



Atty. File: CDT 1746

Group Art Unit: 1754

Examiner: T. Dang

FOR: Process for the Utilization of Refinery C<sub>4</sub> Streams

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**TRANSMITTAL OF APPEAL BRIEF**

1. Transmitted herewith in triplicate is the APPEAL BRIEF in this application with respect to the Notice of Appeal.

**2. STATUS OF APPLICANT**

This application is on behalf of  
☒ other than a small entity  
☐ small entity

3. ☐ Applicant hereby petitions for an extension of time of (1 ) month for filing the Brief from the Notice of Appeal filed \_\_\_\_\_ as provided in 37 CFR 1.136 (a).  
☐ a fee in the amount of \$  
☐ is enclosed  
☐ charge to Deposit Account No. 10-0740. (Duplicate notice enclosed.)  
☐ fee previously paid

**4. FEE FOR FILING APPEAL BRIEF**

Pursuant to 37 CFR 1.17(f) the fee for filing the Appeal Brief is:

☐ small entity \$165.00  
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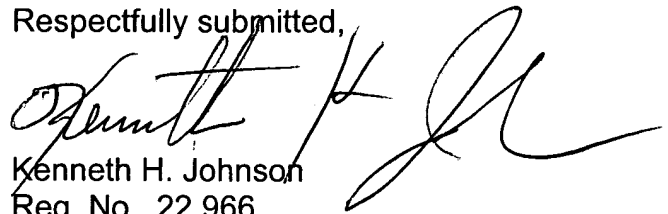
## 5. FEE PAYMENT

☒ Attached is a check in the sum of \$330.00

☐ If any additional fee is required, charge Acct. No. 10-0740.

This sheet is presented in duplicate.

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## CERTIFICATE OF MAILING

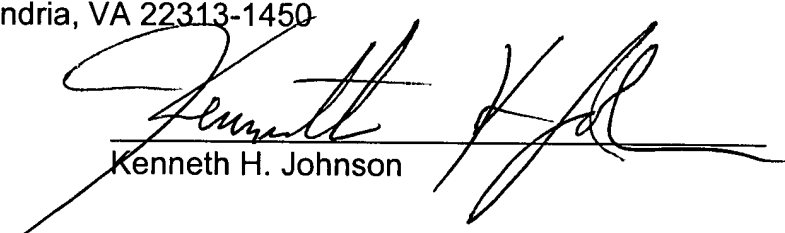
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Kenneth H. Johnson

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In Re Application of:  
Podrebarac et al

Serial No.: 10/055,196

Filed: 01/23/2002



§ Atty File: CDT 1746

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§ Group Art Unit: 1754

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§ Examiner: T. D. Dang

For: PROCESS FOR THE UTILIZATION OF REFINERY C4 STREAMS

BRIEF ON APPEAL

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

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I.

REAL PARTY IN INTEREST

The subject patent application is assigned of record to Catalytic Distillation Technologies. Therefore, the real party in interest is Catalytic Distillation Technologies

II.

RELATED APPEALS

There are no related appeals or interferences known to appellants or appellants' legal representative which will directly or indirectly affect or be affected by or have a bearing on the Board's decision in this appeal.

III.

STATUS OF CLAIMS

Claims 1-13 remain in the application. Claims 7-13 were withdrawn by the examiner(restriction, non elected claims). Claims 1-6 are on appeal and all are rejected.

IV.

STATUS OF AMENDMENTS

All amendments have been entered (No amendment have been presented).

V.

SUMMARY OF THE INVENTION CLAIMED ON APPEAL

"..the invention is an integrated process for the preparation of paraffin alkylate in which a C<sub>4</sub> hydrocarbon feed is first treated to remove dienes and mercaptans , for example, by reacting the dienes and mercaptans to form sulfides, separating the C<sub>4</sub>'s from heavy material comprising the sulfides, for example, by fractionation. The treated C<sub>4</sub> feed is then subjected to isomerization to convert butene-1 to butene-2 and the iso C<sub>4</sub>'s are separated from the normal C<sub>4</sub>, for example by fractionation. The iso C<sub>4</sub> portion is hydrogenated to convert isobutene to isobutane and the C<sub>4</sub> fractions reunited and

subjected to paraffin alkylation to produce an alkylate comprising isooctane.

In a preferred embodiment the C<sub>4</sub> stream is first treated in a first distillation column reactor to remove dienes and mercaptans and separate out any C<sub>5</sub>'s which might be present. The treated C<sub>4</sub>'s are then fed to a second distillation column reactor that concurrently isomerizes 1-butene to 2-butene and splits the normal C<sub>4</sub>'s from the iso C<sub>4</sub>'s. The iso C<sub>4</sub>'s are then fed to a third distillation column reactor where a portion of the isobutene is saturated to isobutane. The C<sub>4</sub>'s from the isomerization/splitter are combined with the C<sub>4</sub>'s from the hydrogenation unit and fed to a cold acid alkylation unit.”  
(Specification page 1, line 24- page 2, line 10)

## VI. ISSUES

1. Does the combination Cosyns et al (U.S. 6,333,422) in view of Umemura et al 3,895,049 make out a *prima facie* case of obviousness of claims 1 and 3-5 under 35 USC § 103(a)?

2. Does the combination Cosyns et al (U.S. 6,333,422) in view of Umemura et al (U.S. 3,895,049) further in view of Hearn et al (U.S. 5,510,568) make out a *prima facie* case of obviousness of claims 2 and 6 under 35 USC § 103(a)?

## VII. GROUPING OF CLAIMS

Claims 1 and 3-5 are grouped together.

Claims 2 and 6 are grouped together.

## VIII. ARGUMENT

### A. The Rejections

In the Final Office Action:

Claims 1 and 3-5 were rejected under 35 USC 103(a) over Cosyns et al '442 in view of Umemura et al '049.

Claims 2 and 6 were rejected under 35 USC 103(a) over Cosyns et al '442 in view of Umemura et al '049 and further in view of Hearn '568.

Applicant respectfully traverses the rejections.

#### B. The Prior Art

Cosyns et al '442 discloses in the Abstract a process reciting some of the steps of the present invention, but does not disclose the presence of mercaptans in the feed or the first step of the present invention "removing dienes and mercaptans from said C4 feed". The reference does disclose the presence of small amounts of butadiene-1,3 in the feed used in the reference process, but makes no effort to remove the butadiene by any means. The reference is completely silent regarding mercaptans.

Umemura et al '049 discloses a process unrelated to the process of Cosyns et al '442 or the process of the present claims. Umemura et al '049 does not suggest removing the dienes and mercaptans. Umemura et al '049 discloses using a feed that contains some 1,3-butadiene which is used to produce more 1,3-butadiene. The feed is also noted to contain trace amounts of mercaptans.

#### C. Issues

1. DOES THE COMBINATION COSYNS ET AL (U.S. 6,333,422) IN VIEW OF UMEMURA ET AL 3,895,049 MAKE OUT A *PRIMA FACIE* CASE OF OBVIOUSNESS OF CLAIMS 1 AND 3-5 UNDER 35 USC § 103(A)?

The examiner's recitation of the disclosures of Cosyns et al '442 and Umemura et al '049 was correct, but incomplete. Cosyns et al '442 does disclose the presence of small amounts of butadiene-1,3 in the feed used in the reference process, but makes no effort to remove the butadiene by any means. The reference is completely silent regarding mercaptans. The examiner acknowledges that Cosyns et al '442 does not disclose the first step of present claims, i.e., "removing dienes and mercaptans from said C4 feed." Umemura et al '049 does not suggest removing the dienes and mercaptans. Umemura et al '049 discloses a process unrelated to the process of Cosyns et al '442 or the process of the present claims. Umemura et al '049 discloses using a feed that *contains* some 1,3-butadiene which is used *to produce more 1,3-butadiene*. The examiner is improperly relying on the silence of the Cosyns et al '442 reference regarding the mercaptans. It is patently improper to rely on any reference for what it does not say. Silence in a reference is not a proper substitute for an adequate disclosure of facts. *In re Burt*, 148 USPQ 548 (CCPA 1966). References are merely evidence. See *In re Hilmer, et al.*, 149 USPQ 480, 490. The examiner fails to provide evidence for the conclusion that it would have been obvious to have modified Cosyns et al '442 to use the Umemura et al '049 feed. The conclusion is pure speculation.

Furthermore, the proposed combination is illogical from the examiners' rationale that since Cosyns et al '442 did not mention mercaptans, it would be obvious to make the combination then to pretreat to remove the mercaptans and the butadiene. This proposal from the examiner is inductive reasoning, which is inappropriate under 35 USC 103. Even with the combination there is no incentive from the art to carry out applicants' first step.

Stated otherwise the examiner cannot merely find a reference with an ingredient not present in Cosyns et al '442 and insert that feed stream without reason then having corrupted Cosyns et al '442 process create a process step not in the references to correct his corruption.

All that is disclosed by the combination as proposed is the Cosyns et al '442 process with the Umemura et al '049 feed exactly as described by Cosyns et al '442.

Thus, the proposed combination fails to make out a *prima facie* case of obviousness. It is well settled that a rejection based on § 103 must rest upon a factual basis rather than conjure or speculation. "Where the legal conclusion of [of obviousness] is not supported by the facts it cannot stand." *In re Warner*, 379 F.2d 1011, 1017, 154 USPQ 173, 178 (CCPA 1967); see also *In re Sporck*, 301 F.2d 686, 690, 133 USPQ 360,364 (CCPA 1962). "Obviousness cannot be established by combining teachings of the prior art to produce the claimed invention, *absent* some teaching, suggestion or incentive supporting the combination." *In re Geiger*, 2 USPQ2d 1276 (CAFC 1987). Hence, without the requisite teaching, suggestions or incentives there is no *prima facie* case and the rejection must fail. The court was addressing piecemeal combination of teachings, which could be argued met the claims, however, the present proposed combination does not even meet the claims of the present invention and does not even rise to the level of putative *prima facie* case. See also *In re Fine*, 5 USPQ2d 1596 and *Ex parte Levengood*, 28 USPQ2d 1300 (BdPatApp 1993).

Thus, even had Umemura et al '049 disclosed the removal of butadienes and mercaptans (which it did not), there is no reason to make the combination with Cosyns et



al '442. A determination of obviousness must involve more than indiscriminately combining prior art; a motivation or suggestion to combine the art must exist. *ACS Hosp. Sys., Inc. v. Montefiore Hosp.* 221 USPQ 929,933 (Fed. Cir. 1984). Such a suggestion may come from the references themselves, from references and disclosures in references known to be of importance in the particular field, and from the nature of the problem, leading inventors to look to references to possible solutions for the problem. *Pro-Mold and Tool Co. v. Great Lakes Plastics, Inc.*, 37 USPQ2d 1626, 1630 (Fed. Cir. 1996). In the present situation the record contains no evidence of a motivation (the mere assertion by the examiner that it would be obvious to make the combination not being one of the enumerated methods to present such evidence).

2. DOES THE COMBINATION COSYNS ET AL (U.S. 6,333,422) IN VIEW OF UMEMURA ET AL (U.S. 3,895,049) FURTHER IN VIEW OF HEARN ET AL (U.S. 5,510,568) MAKE OUT A *PRIMA FACIE* CASE OF OBVIOUSNESS OF CLAIMS 2 AND 6 UNDER 35 USC § 103(A)?

The inadequacies of the Cosyns et al '442 and Umemura et al '049 combination are discussed above. Although Hearn et al '568 shows a method for removing dienes and mercaptans, there is no motivation for the proposed combination and thus this rejection must also fail for not making out a *prima facie* case. *ACS Hosp. Sys., supra*.

"A critical step in analyzing the patentability of claims pursuant to section 103(a) is casting the mind back to the time of the invention, to consider the thinking of one of ordinary skill in the art, guided by the prior art references and the then-accepted wisdom in the field." *In re Kotzab*, 217 F.3d 1365, 1369-70, 55 USPQ2d 1313, 1316-17 (Fed. Cir.

2000). When one considers the rejection in this light, there is no evidence to support the rationales as advanced by the examiner. There is no incentive from Hearn et al to include a thioetherification in the Cosyns et al '442 process.

It is not obvious to employ the Umemura et al '049 feed nor the Hearn et al '568 process because there is no teaching or suggestion to combine them. References are not properly combined if there is no suggestion therein that they should or could be combined, absent applicant's disclosure. *Ex parte Lennox*, 144 USPQ 224; *In re Stephens, et al.*, 145 USPQ 656; *Ex parte McKay*, 147 USPQ 220; *In re Pye, et al.*, 148 USPQ 426; *In re Imperato*, 179 USPQ 730. See also *Ex parte Levengood*, 28 USPQ2d 1300 (BdPatApp 1993). In the present situation the record contains no evidence of a motivation, only the mere assertion that there was modification.

If there is no suggestion therein or no evidence that those skilled in the art would select the art that they should or could be combined absent applicant's disclosure, references are not properly combined. *Micro Chemical Inc. v. Great Plains Chemical Co.*, 41 USPQ2d 1238, 1244 (fed. cir. 1997); *In re Imperato*, 179 USPQ 730 (CCPA 1973); *In re Pye, et al.*, 148 USPQ 426 (CCPA 1966); *In re Stephens, et al.*, 145 USPQ 656 (CCPA 1965); *Ex parte McKay*, 147 USPQ 220 (BdPatApp 1965); *Ex parte Lennox*, 144 USPQ 224 (BdPatApp 1965). See also *Ex parte Levengood*, 28 USPQ2d 1300 (BdPatApp 1993). It is submitted that the combination as proposed by the examiner is based on the applicant's motivation to make the claimed invention rather than any suggestion in the references. Thus, it is not obvious to employ the recited step of Hearn et al '568 because there is no teaching or suggestion to combine any feed or step from one cited reference

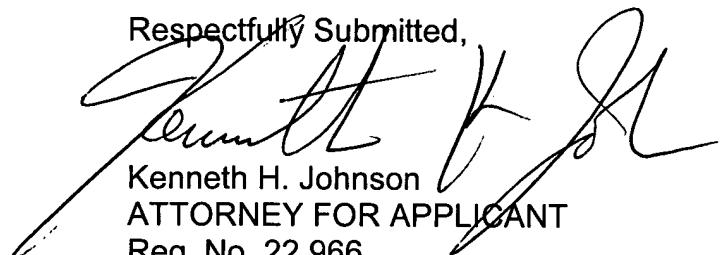
with any the process or feed of any other reference.

D. Conclusion

The combination of art was made merely to overlay the present claims without any form of motivation to do so. Absence an incentive from the combination of Cosyns et al '442 and Umemura et al '049, the further combination with Hearn et al '568 is even more remote and less motivated than the initial combination.

Applicants respectfully request that the board reverse the examiner.

Respectfully Submitted,



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KENNETH H. JOHNSON

IX.  
APPENDIX

A. CLAIMS ON APPEAL

1. An integrated process for the preparation of paraffin alkylate from a C<sub>4</sub> feed containing isobutane, isobutene, normal butane, butene -1, butene 2, dienes and mercaptans comprising:

removing dienes and mercaptans from said C<sub>4</sub> feed;  
isomerizing a portion of the butene-1 to butene-2;  
separating iso C<sub>4</sub> components from the normal C<sub>4</sub> components;  
hydrogenating a portion of the isobutene in said iso C<sub>4</sub> components to isobutane;  
recombining said normal C<sub>4</sub> components and said iso C<sub>4</sub> components and  
alkylating isobutane and normal butenes in said recombined C<sub>4</sub> components to produce an alkylate comprising isooctane.

2. The process according to claim 1 wherein said removing of dienes and mercaptans comprises reacting said dienes and mercaptans in the presence of a thioetherification catalyst and hydrogen under thioetherification conditions to form sulfides and fractionating the resultant mixture to separate a heavy portion comprising said sulfides.

3. The process according to claim 1 wherein said isomerizing is carried out in the presence of an isomerization catalyst and hydrogen under isomerization conditions.

4. The process according to claim 1 wherein said separating is by fractionation.

5. The process according to claim 1 wherein said alkylating is carried out in the presence of an acid catalyst under alkylation conditions.

6. An integrated process for the preparation of paraffin alkylate from a C<sub>4</sub> feed

containing isobutane, isobutene, normal butane, butene -1, butene 2, dienes and mercaptans comprising:

reacting said dienes and mercaptans in the presence of a thioetherification catalyst and hydrogen under thioetherification conditions to form sulfides and fractionating the resultant mixture to separate a heavy portion comprising said sulfides;

isomerizing a portion of the butene-1 to butene-2 in the presence of an isomerization catalyst and hydrogen under isomerization conditions;

separating iso C<sub>4</sub> components from the normal C<sub>4</sub> components by fractionation;

hydrogenating a portion of the isobutene in said iso C<sub>4</sub> components to isobutane;

recombining said normal C<sub>4</sub> components and said iso C<sub>4</sub> components and

alkylating isobutane and normal butenes in said recombined C<sub>4</sub> components in the presence of an acid catalyst under alkylation conditions to produce an alkylate comprising isooctane.